



Windbreaks, shelterbelts improve animal well-being, reduce costs.

by Heather Smith Thomas

In climates where wind chill can be an issue during colder months, planning ahead can reduce feed and health costs, minimize body condition losses and enhance gains of young animals.

Natural barriers

Trees and brush or shelterbelts can provide a lot of protection in a winter pasture, says Kiernan Brandt, an extension cow-calf field specialist for South Dakota State University (SDSU). “For a shelterbelt, it’s best to plant a mix of species — some tall, some medium height and some low to the ground.”

An understory of brush is helpful, he says, but for more protection, include evergreens because they won’t lose their leaves.

Brandt recommends planting multiple rows spaced to allow the trees to grow without crowding.

“You don’t want them too dense; it’s best to have a little space between so some air can actually pass through,” he explains. “You want trees to slow the wind, not stop it completely.”

If tree spacing is too tight, the wind will go around the shelterbelt rather than being slowed down and passing through.

“Sometimes a strong wind will go faster as it whips around the end of the shelterbelt,” Brandt says. “This can increase drifting and may create drifts over roads.”

Brandt urges producers to consult with local extension, the Natural Resources Conservation Service (NRCS) or another expert

resource to select the right blend of species to provide the best coverage. They can advise you in selecting plants that will do well in your climate and region, and that might benefit wildlife, he says.

Artificial obstacles

Many materials can be used for man-made windbreaks.

“Use something heavy-duty that will hold up to strong winds and cattle rubbing,” Brandt advises. “Windbreaks on high points or exposed faces where there may be heavy wind or strong gusts need to be sturdy.

“I am from southern Wyoming, and we get a lot of wind there,” he continues. “I’ve seen guys create windbreaks with old power poles, chiseling the ends to fit together like Lincoln Logs®, and bolted together, able to withstand big gusts and not tip over.”

Brandt notes that wood posts should be set 3 feet (ft.) to 5 ft.



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deep — reaching below the frost line. Otherwise, they may work out of the ground with frost heaves.

Wood posts should be about 8 inches (in.) in diameter, he says. “Large drill pipe (6 in. to 8 in.) will also work nicely.”

Length and height of a windbreak will be determined by the amount of area you need covered.

“We use a rule of thumb of 25 square feet per cow,” he says.

The height determines the distance of protection behind the

windbreak. The length determines how many cattle you can protect. Estimate about 1 ft. of fence per animal.

The material you attach to the posts should not be solid, but have some gaps, he notes.

Windbreaks are often made with boards placed vertically, leaving spaces between them, says Joseph Darrington, former SDSU ag engineer. “The target porosity is from 20% porosity (open) and 80% solid to 65% or 70% solid. If you have more than 35% porosity or closer to 50-50, you’ll have more air velocity coming through rather than being pushed up and over.

“If you use 1-by-6-inch boards, which are actually 5½ inches wide and ¾ inch thick, spacing would be 1½ to 2 inches apart. This would be 7½ inches on center (from the



head-on, perpendicular to it, this creates a triangular protected zone behind it.”

Some producers use vertical metal roofing.

“A 30-inch piece of roofing metal gives enough space for calves to nestle against it and be protected. You need a bigger gap, however, to create adequate porosity so snow won’t collect right behind it,” he says.

Directional diversions

Windbreaks are usually constructed to face the prevailing wind. If wind tends to come from several directions, you might create a curved or cornered structure. Experts can help you think through placement of the windbreak to provide the most protection.

“In our region the predominant cold wind usually comes from the northwest, so we position windbreaks running from southeast to northwest, to be perpendicular to the prevailing wind,” Darrington explains. “For a larger protected area, ranchers sometimes run another windbreak from northwest to southeast, creating an arrowhead shape pointing north, to give the greatest protection.”

Brandt advises people to leave a gap at the bottom to allow some air to pass through along the ground. This keeps snow from building up right in front of it, or dumping in a big drift on the

downwind side after the wind goes up over the windbreak, he says.

“When planning a structure, think about where snow will collect after you redirect the wind,” Brandt says. “You want it out of the way so that when the drifts melt, moisture can drain away and not cause problems with mud.”



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“When planning a structure, think about where snow will collect after you redirect the wind,” Brandt says. “You want it out of the way so that when the drifts melt, moisture can drain away and not cause problems with mud.”

A big drift right in front of the windbreak may take a while to melt in the spring, and if it’s piled against a wooden structure, snow can keep it wet a long time and damage the wood.

When creating anything permanent — whether natural or man-made — it pays to consider placement for the greatest long-term benefit, Brandt observes.

“You don’t want it to create drifts over roads or paths, or in front of grain bins or hay sheds.”

It helps to know how the land lies, where water drains, where cattle like to gather, where they have to go for water and where you need to go to take feed to them during severe weather. Take time to plan the site and setup for a windbreak.

Portable problem-solvers

Windbreaks don’t have to be permanent. A stack of big bales (hay or straw) can provide protection along a fence, especially if cattle are fed enough they don’t try to crawl through the fence to get to the bales. Cattle have a lot of

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center of one board to the center of the next),” he continues.

“You don’t want a solid windbreak because it significantly reduces wind speed right next to it. If there’s snow with wind, it dumps more of it behind the windbreak,” Darrington explains.

This reduces the protected area for cattle to bed or stand behind.

“With 30% open and 70% solid, the protected zone behind the windbreak will extend 10 to 15 [times] and sometimes up to 20 times the height of the windbreak,” he says. “A 10-foot-tall fence slows the wind for about 100 to 150 feet behind it. If it’s a straight windbreak and the wind is coming

protection if they are tucked behind a 90° corner of bale stacks.

Sections of homemade portable windbreaks can be moved with a skid steer or tractor.

“These work well, as long as they are heavy enough,” Brandt says. “Make sure they have a strong, wide, heavy base — about 1.5 times the height of the structure. A 10-foot-tall windbreak would need a base about 15 feet wide.”

Portable windbreaks can be moved from pasture to pasture with the cows. They can work well for cattle on cornstalks where there’s not much wind protection.

“Having something that can be picked up and moved from one pivot to the next can be very beneficial,” he says.

No matter the type of structure, the goal is the same: to reduce stress all the way around. |

Editor’s note: Heather Smith Thomas is a freelance writer and cattlemaster from Salmon, Idaho.

Windbreaks quickly pay their way

Windbreaks can minimize cold stress by reducing the effect of wind chill. Table 1 shows the colder effect caused by certain wind speeds at various air temperatures.

“With no wind, temperatures below 30° F necessitate more feed for cattle to generate the energy necessary to keep warm,” says Kiernan Brandt, South Dakota State University Extension cow-calf field specialist. “Every 10° drop due to wind chill is about a 13% increase in feed requirements — just for the cattle to maintain body heat. If it’s 30° outside, a 20-mile-per-hour wind will increase energy requirements by about 25%. We need to make sure there’s enough [room] behind a windbreak to protect most of our animals at any given time.

“Here in South Dakota, we get weeks, sometimes months of severe weather, so it doesn’t take long for a windbreak to pay for itself in feed saved,” Brandt says.

Otherwise, cattle must eat more or they will lose weight — and at a time of year you don’t want them losing weight.

Windbreaks offer benefits throughout the year, Brandt says, noting that calves are susceptible to severe weather, hot or cold.

“During hot weather in summer, windbreaks create shade for calves,” he says. “This is important here,

Table 1: Effect of wind speed at various air temperatures on wind chill

Wind speed	Air temperature, ° F				
	-10°	0°	10°	20°	30°
5 mph	-16°	-6°	3°	13°	23°
10 mph	-21°	-11°	-1°	8°	18°
20 mph	-30°	-20°	-10°	0°	9°
30 mph	-46°	-36°	-27°	-16°	-6°

SOURCE: “Understanding Cold Stress,” by Warren Rusche, assistant professor and SDSU Extension feedlot specialist. Available online at <https://extension.sdstate.edu/how-does-cold-stress-affect-energy-needs-cattle>.

where we have a lot of crop integration in livestock systems. Many people raise corn and soybeans as well as cattle, and those fields have no natural shade.”

Windbreaks used in feedlots can be converted to shade structures in summer if air can move through.